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OMICS technologies in reproductive medicine: Assessment of quality of oocytes and embryos

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Abstract

© 2018 Human Stem Cell Institute. All rights reserved. One of the main factors of success of the procedure art (assisted reproductive technology) is the selection of the most high-quality gametes for further manipulation and obtaining a viable embryo for implantation. The majority of modern techniques based on morphokinetic predictors of quality (i. e. assessment of embryo morphology and rate of division of the blastomeres), which allowed to achieve some success in increasing the percentage of successful pregnancies and reduce the number of multiple pregnancies, but their accuracy is currently insufficient. Thus, the development of objective, reliable, fast and affordable test systems to determine the quality of oocytes and the development potential of the embryo one of the challenges of reproductive medicine. The purpose of this review was to describe the advantages and limitations obecnych technologies, the application of which will allow to deepen our understanding of the physiology of the embryo, as well as set criteria for non-invasive selection of gametes and embryos. In this regard, recently in assisted reproduction are applied the studies of genomic, proteomic, transcript, and metabolomic profiles of oocytes, granulosa and Cumulus cells, embryos, of conditioned media.

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Keywords

Blastocyst, Embryo, Genomics, Metabolome, Proteome, Secretome, Transcriptome

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